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Internationalization Patterns of Small High Technology Firms:

Keep On, Step Back or Withdraw

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Abstract

This study aims to further the understanding of the cross-border activities of Small High Technology Firms (SHTFs) through a qualitative, longitudinal insight into the post-internationalization behaviour of four Scottish SHTFs. The focus is on decisions that led to the reduction of international activity or withdrawal from international engagement. Future research questions and recommendations to policy makers are provided. As the research findings provide support for an emerging concept of a cyclical mode of internationalisation, the authors suggest furthering the research on the cyclical mode of internationalisation arguing that it may provide a better understanding of a more holistic internationalization process of the firm. In light of the above, policy makers are advised to support firms' inward international operations and provide tailored cross-border support to small firms by changing their trade support mission from supporting *exports* to providing more general support for *internationalization* as a process of firm growth and development.

Internationalization Patterns of Small High Technology Firms:

Keep On, Step Back or Withdraw

INTRODUCTION

The last decade of the 20th century can be characterized as the one that so far has contributed most to the body of knowledge relating to the internationalization of Small High Technology Firms (SHTF). During that period, the focus was primarily on the growth – or positive development – of international business operations (Benito and Welch, 1997). However, most of newly internationalized firms fail in their efforts, or achieve low levels of success. This is particularly true not so much at the initial internationalization stage, e.g. of sending out some exports, but at the next stage of real international commitment, e.g. making an international investment (Yip et al, 2000). In such situations, trying to manage the firm's portfolio proactively (Douglas and Craig, 1996), the managers may decide to reduce the international engagement or leave the foreign market completely (Pauwels and Matthyssens, 1999). Hence this paper aims to further the understanding of cross-border activities of SHTF by getting a qualitative longitudinal insight into the post internationalization behavior of SHTFs with the focus on those SHTFs that reduce their international engagement. It proceeds with the review of the literature on the internationalization of the SHTF. The literature review is followed by a discussion of the research methodology. Research findings are then presented, followed by discussion that relates emergent findings back to the literature. Recommendations to both academia and policy makers conclude the paper.

LITERATURE REVIEW

The literature review plans to refine the research questions and conceptualize the research framework. As the ultimate aim is to understand and explain why small firms reduce their

international engagement, the literature review will focus on the following three themes, i.e. processes, patterns and pathways of internationalization.

Processes of Internationalization

As far as the theoretical validation of the internationalization process of the firm is concerned, two schools of research have evolved to dominate the contemporary research on the internationalization of small firms (for comprehensive review see Coviello and McAuley, 1999), i.e. Stage approach initiated by Cavusgil (1980), Johanson and Vahlne (1977), Johanson and Wiedersheim-Paul (1975), and Network approach initiated by Johanson and Mattsson (1988 and 1992), Johanson and Vahlne (1977).

Known also as Uppsala model, the Stage approach suggests that each stage of internationalization involves an increased commitment to international activities and that the process of internationalization is the consequence of the acquisition of experiential knowledge, in particular, market specific knowledge. Commitment increases as firms learn more and therefore become less uncertain about foreign markets (Cavusgil, 1984; Johanson and Vahlne, 1977). However the Stage approach was widely criticized (for comprehensive review see Andersen, 1993), and widely challenged in the literature (recent examples include Bell, 1995; Bell et al, 2001; Knight et al, 2001). The major limitation of the Stage approach is in its use of linear models to try to explain complex, dynamic, interactive and frequently non-linear behavior (Bell, 1995); thus the possibility of explaining and understanding the inward internationalization patterns, as well as the reduction of international activity is phased out.

At the same time the Network approach has received a lot of attention and recognition in the process of explaining the internationalization of small firms (recent examples include Anderson et al, 1994; Coviello, 1996; Coviello and Martin, 1999; Coviello and Munro, 1995; Elg and Johansson, 1996; Tikkanen, 1998). It is based on theories of social exchange and resource dependency, and focuses on firm behavior in the context of a network of inter-

organizational and interpersonal relationships (Axelsson and Easton, 1992). It has been suggested that success in new foreign market development is rooted in a firm's relationships in current markets, whether these be domestic or foreign, rather than in the identification and analysis of foreign market characteristics and the development of tailored market strategy (Johanson and Mattsson, 1988). Also the Network approach provides for reciprocity between inward and outward activities (Crick and Jones, 2000), and recognizes the importance of the networking role on inward international activities as part of the growing research on networks and internationalization (Johanson and Mattsson, 1988; Johanson and Vahlne, 1990).

Patterns of Internationalization

However, the empirical literature on internationalization has tended to focus on the outward rather than inward patterns, while inward-outward patterns of internationalization have received limited coverage (Korhonen et al, 1996). As a result a holistic approach towards internationalization of SHTFs has been called for, where both inward and outward patterns of internationalization have been emphasized and described, (recent examples include Bell, 1995; Crick and Jones, 2000; Jones, 1999; Jones and Tagg, 2001; Korhonen et al, 1996; Oviatt and McDougall, 1994; Welch and Luostarinen, 1993).

The issue of inward-outward activities is crucial to be investigated not only from academic point of view, but also from policy making stand point. As government organizations tend to encourage only outward operations (mainly exports that contribute positively to the Balance of Payments), and to some extent inward investment (which makes a positive contribution to the local economy and ultimately stimulates export), many inward activities by foreign firms maybe overlooked as internationalization opportunities for domestic enterprise. In their study Korhonen et al (1996) found that for a majority of Finnish SMEs the inward operations were their first internationalization stage, whereas the outward operations played second role. Crick and Jones (2000) put forward criticism in relation to

policymakers' current approach to categorizing internationalization of small firms in the provision of trade assistance programs and suggest that international expansion strategies other than pure exporting may better represent such processes. From the point of view of decreasing the level of international involvement or even withdrawing from international activity, the understanding of inward-outward patterns of internationalization is pivotal as it allows the interrelation and integration of (such) decisions and (such) processes that identify a firm's individual pattern(s) of internationalization (Jones, 1999).

Pathways of Internationalization

In their internationalization efforts, most of newly internationalized firms fail or achieve low levels of success. This is particularly true not only at the initial internationalization stage, e.g. of sending out some exports, but also at the next stage of real international commitment, e.g. making an international investment (Yip et al, 2000). In such situations, trying to manage the firm's portfolio proactively (Douglas and Craig, 1996), the managers may decide to reduce the international engagement or leave the foreign market completely (Pauwels and Matthyssens, 1999).

In an attempt to explain and understand how and why companies decrease their international involvement, it has been suggested that firms may experience 'epochs' of internationalization, followed by periods of consolidation or retrenchment, or they may be involved in particular 'episodes' that lead to rapid international expansion or de-internationalization (Oesterle, 1997); also the existence of different internationalization 'pathways' and 'trajectories' has been acknowledged and explored (Bell et al, 2001; Knight et al, 2001). However, to date, the research on the reduction of internationalization engagement is far less common (Benito and Welch, 1997; Crick, 2001; Pauwels and Matthyssens, 1999), probably due to the seemingly negative and undesirable features associated with these phenomena (Benito and Welch, 1997), e.g. human nature having a tendency to suppress

admission of failure (Clarke and Gall, 1987). Contrary the managers' decisions to either reduce the international engagement or leave the foreign market completely should not be viewed as a failure, and this becomes important when determining the trade support that might be required by managers, and available to them (Crick, 2001). However the authors do not fully agree with Crick (2001) where he sees the trade support as a means to avoid withdrawal. Trade support might be needed to encourage withdrawal in order e.g. to maximize on domestic market opportunities. Thus, investigating the underlying drivers of why small firms reduce (or even withdraw from) their international engagement may lead to a better understanding of a more holistic internationalization process of the firm (Pauwels and Matthyssens, 1999). In this context, the authors investigate the post-internationalization behavior of SHTF with the focus on those firms that reduced their international engagement.

RESEARCH OBJECTIVES

Given the importance of firms' decisions to reduce their international engagement to both managers and policy makers, as well as realizing the existence of the gap in the body of literature relating to understanding the existence and nature of such decisions, this study aims at getting a qualitative longitudinal insight into the post-internationalization behavior of SHTFs with the focus on those firms that reduced their international engagement by addressing the following research questions: (i) initial market and entry mode selection and the rationale behind these decisions; (ii) subsequent market and entry mode selection and the rationale behind these decisions; (iii) impact of latter decisions on firms' performance.

METHODOLOGY

Without entrepreneurial commitment, determination, vision, energy, tolerance of risk and ambition, the entrepreneurial process in small firms would not happen (Hill and McGowan, 1999), and provided that each individual entrepreneur constructs his or her own reality according to how he or she interprets and perceives the world (Hill and Wright, 2001), the

authors considered that the research shall be inductive in nature and qualitative research techniques shall be used. Consequently, semi-structured in-depth interviews were employed as the most appropriate research means. The main reason for using in-depth interviews is that they provide a means to understand why persons act as they do, and to understand the meaning and significance they give to their actions, in such a way that they can tell the interviewer in their own terms (Jones, 1985).

The exploratory study was conducted first through secondary research in the sectors of optoelectronics, software, and biotechnology in order to determine the background and context within which the selected firms operate. The authors took appropriate measures to minimize the bias during the interviews, by interviewing respective Scottish Enterprise industry sector teams, as well as the selected firms to confirm scenarios from the perspective of each of these groups. Open ended questions, followed by appropriately worded probing questions, but avoiding a leading bias, were used during semi-structured interviews. This ensured some comparativeness between the responses, and allowed sufficient control over the interview so as to insure that the research objectives were met. During the second wave of the research, unstructured interviews were used to allow the respondents the opportunity to explore e.g. on 'what happened since then'.

Four Scottish firms were purposefully selected from a larger sample (Turcan, 2000) that has been withdrawn from Scottish Enterprise Membership Directories. The following selection criteria were used: (i) number of employees at a maximum of 100 (Storey, 1994); (ii) domestically owned; and (iii) had reduced their international involvement. Four interviews were conducted in summer of 2000 with the firms' managing directors as these respondents were directly involved in the decision-making process regarding both increasing and decreasing levels of internationalization of the firm. The firms' characteristics are presented in Table 1 below. To provide anonymity Firms are coded by numbers.

Table 1. Case studies' summary (as of summer 2000)

Case Site	Firm Size (employees)	Firm Age (years)	Years Overseas	Foundation Method	First Foreign Market	Market Niche
1	34	13	12	Start-up	Holland	Opto Electronics
2	10	8	1	Start-up	Germany	Software
3	6	23	22	Spin-off (University)	Iraq	Opto Electronics
4	42	4	4	Management buy-out	USA	Software

Subsequent research took place in autumn 2001 by following up the activities of the four firms originally studied in summer 2000. Firm 1 was found to have been acquired by an MNE (Multinational Enterprise) and thus did not meet any further selection criteria for a small firm. Firm 2 had ceased to trade, and the director of Firm 3 was unattainable for interview. The director of firm 4 was interviewed and was able to fully account for the internationalization process in the intervening period and the decisions that had been made. From the point of view of the researchers, the fact that half of the firm's studied had ceased to exist as small independent firms was disappointing however, drawing on Storey's estimates of small firm survival after three years (Storey, 1994), it is not surprising and highlights the challenge of continuity faced by longitudinal research design on small firms.

CROSS CASES ANALYSIS

Cross-case analysis is summarized in Table 2 and specific firms' internationalization patterns and trajectories are presented in Figures 1, 2, 3, and 4 respectively. The discussion will start with uncovering and understanding firms' first international experience, then subsequent market and entry mode decisions will be analyzed, followed by the impact the latter decisions had on the firms' performance.

Table 2. Cross-Case Analysis

	Firm 1	Firm 2	Firm 3	Firm 4
Year of foundation	1987	1992	1977	1996
Internationalization gap, years	1	7	1	0
Resources/Experience before Internationalization:				
Existed	Marketing, management, international, know-how	R&D, technical expertise; know-how	Technical expertise; know-how	R&D, technical expertise; know-how
Required	Funding	Marketing, management, international, funding	Mkt/Mng, international, production, funding	Marketing, management, international
Markets:				
First international market	Holland	Germany	Iraq	USA
Next international market	USA, rest of world	USA	EU, USA, rest of world	UK
Status as of 2001	Acquired by MNE	Out of business	Unknown	UK
Entry modes:				
First entry mode(s)	Export-overseas distributor	Export-overseas distributor	Licensing; Direct exporting	Direct exporting
Subsequent entry mode(s)	OEM deal	Joint Venture	Direct exporting	No international activity
Status as of 2001	Acquired by MNE	Out of business	Unknown	No international activity
Reasons of changing (or not) the modes of entry				
Subsequent entry mode(s)	Maximizes opportunities	Bad experience with foreign distributor	Licensing created new competitor	Change in business orientation
Status as of 2001	Acquired by MNE	Out of business	Unknown	High potential in UK market
Internationalization decisions				
First Experience	Networking + planning	Networking	Networking	Networking
Subsequent Experience	Networking + planning	Networking + planning	Networking	Networking + planning
Status as of 2001	Acquired by MNE	Out of business	Unknown	Networking + planning

Figure 1. Firm 1 Internationalization Patterns

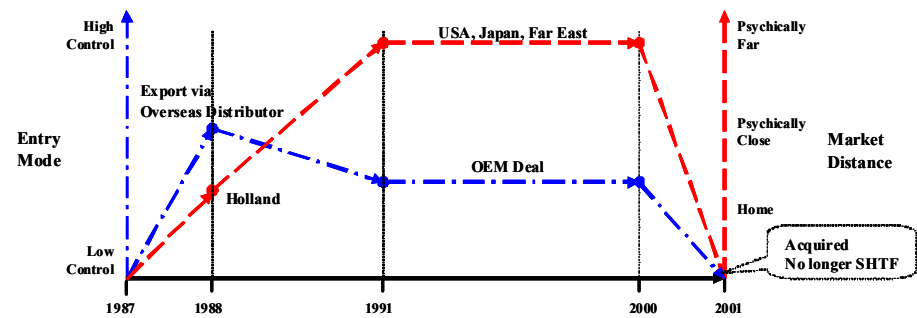


Figure 2. Firm 2 Internationalization Patterns

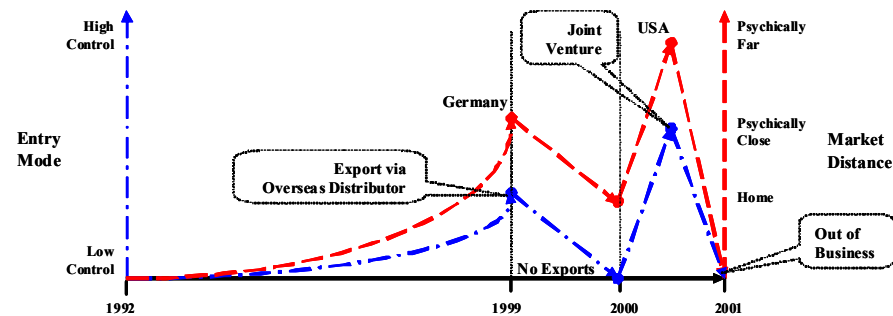


Figure 3. Firm 3 Internationalization Patterns

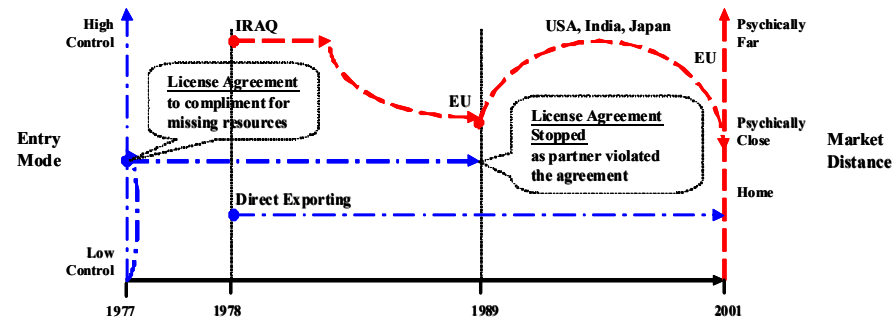
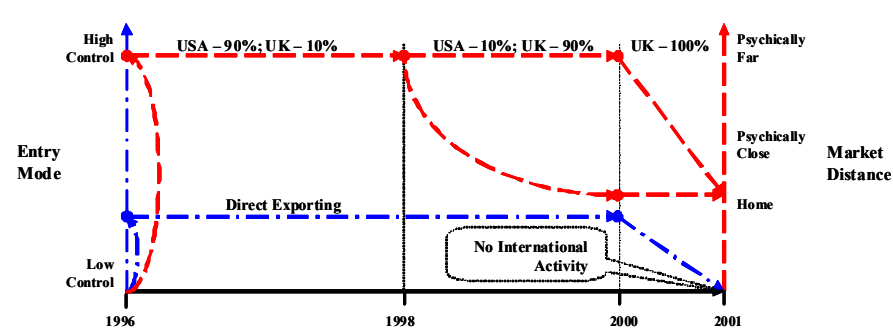


Figure 4. Firm 4 Internationalization Patterns



Initial Market Entry and Entry Mode Selection Rationale

Regardless of the scarcity of resources at the beginning of internationalization (Table 2), Firms 1, 3, and 4 internationalized within the first year after their foundation. Thus Firm 1 in an attempt to maximize on market opportunities and attract funding for the venture, started its international activity (first launch) one year after its foundation in Holland through a distributor. Firm 3, after a spin-off from a university, licensed its products to a local company that had production, purchasing, and marketing/commercial experience and facilities, and, having received unsolicited orders one year later, the venture directly exported its products to Iraq till the technology transfer to Iraq was banned. Firm 4, right after management buy-out of the R&D lab, continued several international projects that came with from the parent company on software technologies serving USA market through direct exporting. As regards Firm 2, it did not internationalize for 7 years and started its international experience via exporting through an overseas agent to Germany. Major inhibitors to the internationalization of Firm 2 were perceived to be: (i) tightly structured, highly competitive and highly internationalized market, (ii) lack of marketing, sales and after-sales services expertise, and (iii) lack of any international experience.

Subsequent Market Entry and Entry Mode Selection Rationale

At this point it is very important to stress that neither of the interviewed firms acquired missing resources prior to internationalization, but instead they sought quickly to compliment scarcity of resources through either external bonds or new business strategies. As can be seen from the following discussion, lack of identified resources was one of the primary motives to change the subsequent market and associated entry mode, or even change the strategic focus.

For example, Firm 1 attempt to attract funding for the venture via a deal with a distributor form Holland failed due to the mismatch between the Firm 1 and distributor; even though a lot of market research was done in identifying potential customers, specifications,

and distribution channels. After this failure, Firm 1 went to USA for a deal with an OEM (Original equipment Manufacturer) that had a complimentary product. This allowed Firm 1 to use the OEM's distribution channels and target the same customers that Firm 1 intended to target. However, Firm 1 had quite complex relationships with that OEM; as Firm 1 director stated: *"OEM is like a Venus Flytrap. Initially good relationships, first two years high, growing sales volume. As competition grows, the OEM asks for new product/alterations; this causes you to allocate a lot of effort into R&D... It is a major challenge to maintain good relationships with them (OEM's)."* But this satisfied Firm 1 as the focus was on the short-term sales. Within three consecutive years Firm 1 went to Far East and Japan and repeated the US experience. Firm 1 thought to establish sales representation in the major markets, but it never got to this stage. Firstly, because of the recession in mid 90's that made customers stop buying Firm 1's products and secondly, at this time Firm 1's main product had matured. All of these factors led to sharp decrease in sales, and subsequently to a new product development for a new niche market that was worth about \$ 3 billion, with about 20% annual growth. Due at least in part to this success, in 2001 Firm 1 was acquired by an MNE (Multinational Enterprise) (see Figure 1). As it no longer met the criteria for a small firm as indicated in this study, its development was pursued no further.

Firm 2, experienced a troubled start to its exporting activities and after reporting losses from these activities to Germany, brought in a non-executive manager/consultant. Advice given however did not go far enough in redressing the problems and subsequently, Firm 2 was forced to withdraw from Germany (see Figure 2). As a result Firm 2 was considering the opportunity of investing in full time marketing and sales personnel, and was regarding the USA as a strategic market. In 2001, when the authors attempted to contact Firm 2 for the second wave of the research, it was found that Firm 2 was out of business for reasons unknown to the authors. However, from the secondary research undertaken in 2001, the

authors were able to track some of the activities Firm 2 performed during 2001. It was for example ascertained that Firm 2 formed a partnership with an USA firm for joint product development and was actively involved in receiving government trade support. Also the authors met with the respective Scottish Enterprise team representatives that stated: “... *they* [Firm 2] *just did not have enough cash coming in to survive*”.

By licensing its products to a local company, Firm 3 gave up the control over its marketing, commercial, and production operations in exchange for the high returns from those operations. But the license agreement lasted approximately 11 years when Firm 3 realized that a new strong competitor in the face of their license partner was created that violated the license agreement by selling the licensed product under its own brand name. After this incident, Firm 3 started investing in marketing/sales expertise, testing/assembling facilities; and in rebuilding the customer database. The easiest part, in their view, was the customer database. As Firm 3 director stated: “*We managed not to give full control over the commercial operations to our agent [license partner], thus being involved in design and manufacture, sales activity, participating in the exhibitions ...*”. As a result, Firm 3 switched to direct exporting as its only international operation mode (Figure 3). Firm 3 seeks the opportunities, develops and maintains its customer database and gains knowledge about the market due to its developed networks and relationships with market players. Firm 3 Director was not able to participate in a subsequent interview motivating that it was a very busy time for its Firm.

Firm 4, having enjoyed ‘easy-come’ projects that were passed over from the parent company after the management buy-out, realized, when these projects were about to end, that (i) it was operating without any focus; (ii) there were losses due to the lack of market and marketing knowledge and experience; and (iii) there was a need to explore new market opportunities in order to stay in business. As Firm 4 director stated: “*It was difficult to find a*

balance between sell and deliver. We were in the markets without knowing why we were there.” These situations Firm 4 found itself in turned out to be the turning point in its internationalization process. Thus Firm 4 in 1998 identified an opportunity for further growth and decided to invest in Java as a potential market, forecasting about 300% growth in revenue by year 2000; major business being within UK, about 90%. When in 2001 the authors met with Firm 4 director for the subsequent interview, Firm 4 had withdrawn totally from international activity and was focusing exclusively on the UK financial market (Figure 4). This turn around in the business orientation of Firm 4 was possible due to UK regulations (e.g. on customers access to data; distribution of financial products) that forced companies to adopt E- and Internet-based solutions for their businesses. In relation to this Firm 4 director stated: *“There are two ways to make a donkey move, i.e. either to flutter a carrot in front of it or hit it with a stick from behind. We found that the stick worked ...”* When asked about the internationalization plans, Firm 4 director said: *“... it is not wise to go international without building capability locally. It is like in football. If you do not perform at home, it is unlikely you will perform well in European championships”*.

Impact of Decisions to Reduce International Involvement on Firms' Performance

Despite Firm 1 identified on time new market opportunities and developed a new product for a fast growing market, it could not capitalize itself on those opportunities and was recently acquired by an MNE. Its mistakes may have been on relying too heavily on one OEM firm, or in not providing the security required by an OEM in terms of security of supply, quality lead time etc. These are suppositions however to which the authors don't have answers, but are worth to be further researched.

As regards Firm 2, and based solely on first research findings as well as on subsequent web based secondary research and primary research conducted with Scottish Enterprise, it can

be assumed that not only lack of funding, but more importantly, failure to find its competitive advantage led to Firm 2's bankruptcy, thus forcing Firm 2 out of business.

As Firm 3 was not able to meet for subsequent interview, it is not possible to make any longitudinal inferences regarding its performance. Based on findings from the first interview, Firm 3 was reacting to un-solicited orders and had not yet acquired marketing expertise.

Firm 4, after operating for several years without any focus and incurring operational losses, was forced to explore new market opportunities in order to stay in business, and turn around its business orientation. Even Firm 4 did not achieve its forecasted 300% growth in revenue by 2000; it succeeded to double its revenue in 2001 and achieved an annual turnover of about £4 million. As Firm 4's director stated: "*Value delivery is our strength. ... we are now moving up their [customers] value chain*". The success of the enterprise, Firm 4's director sees as lying: "*... in high quality of our service delivered; in repeat businesses with large customers like Orange; Standard Life; Tesco; in networking with big players (e.g. IBM) - they [big players] are trying to mitigate their risk by partnering down the value chain; in optimizing our expenditures; in direct and focused business to business networking*".

DISCUSSION

This study aimed at getting a qualitative longitudinal insight into the post-internationalization behavior of SHTFs with the focus on those firms that reduced their international engagement, by addressing the following research questions: (i) initial market and entry mode selection and the rationale behind these decisions; (ii) subsequent market and entry mode selection and the rationale behind these decisions; (iii) impact of latter decisions on firms' performance.

Overall, research findings showed that the international expansion of SHTFs was influenced mainly by network relationships within both domestic and overseas markets, started in an opportunistic mode, and driven by firms' directors' initiatives. In general this

conclusion supports the findings of previous research in the area of SHTFs internationalisation (Coviello and Martin, 1999; Coviello and Munro, 1997; Dennis, 2000; Elg and Johansson, 1996; Johnsen and Johnsen, 1999; Jones, 1999; Zafarullah and Young, 1998). However, the impact of networks on subsequent internationalization of SHTFs diminishes over time if a strategic approach is not adopted and if resources lacking at the beginning of internationalization are not acquired in time (supported by Carter and Jones-Evans, 2000; Coviello and McAuley, 1999; Jones, 1999).

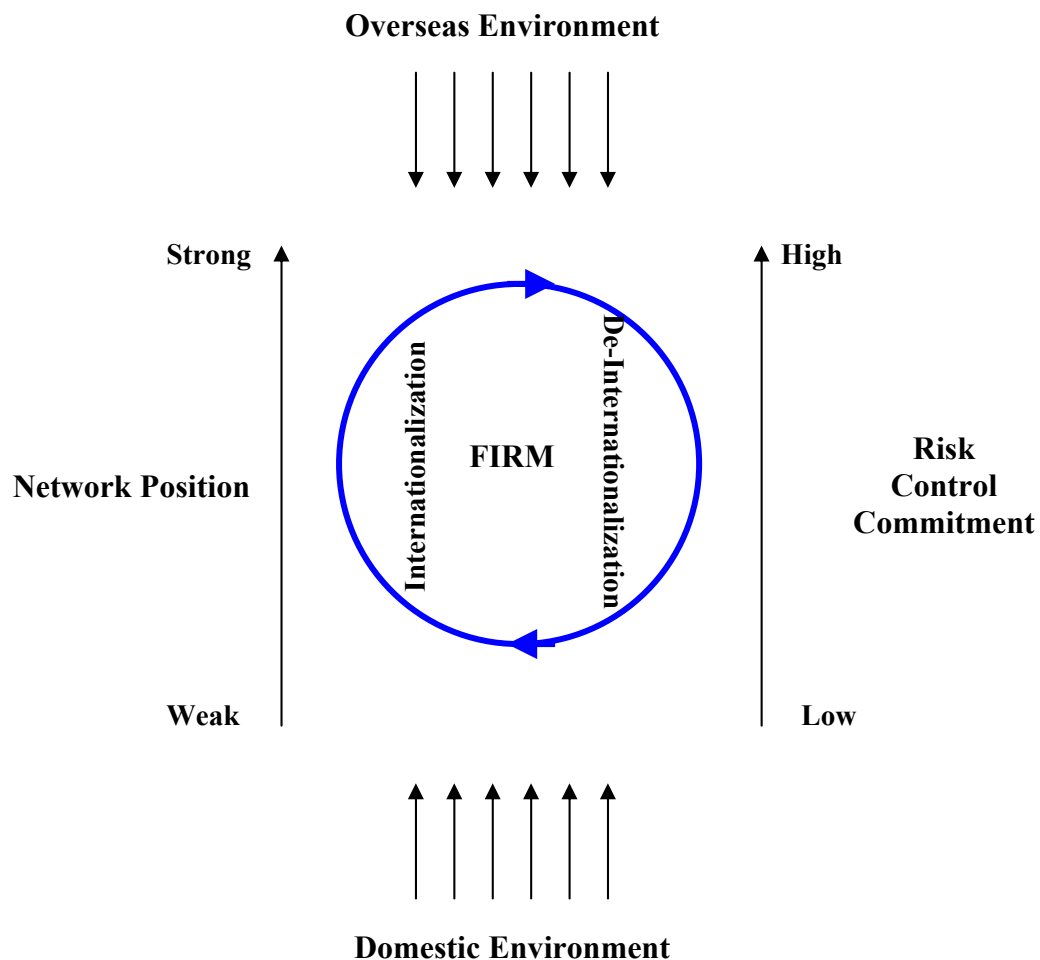
As far as the choice of location is concerned, primarily firms entered the markets where they can commercialize their innovative, high technology products, rather psychically close markets. With regard to entry mode decisions, the most frequently used mode to supply the foreign markets was exporting (either through foreign agent or directly); also firms used licensing and product development partnership as an alternative mode of entry to exporting.

In respect to internationalization patterns, the findings further challenge the Stage theory in that firms made reversal decisions and reduced or even withdrew from their international activity due to external (e.g. economy recession, product matured, complex relationships, creation of new competitor) or internal (e.g. lack of resources, lack of strategic focus) factors, but are consistent with recent ones that emerged in the literature (Bell et al, 2001; Crick, 2001; Crick and Jones, 2000; Knight et al, 2001).

Finally, the research findings bring evidence of a cyclical mode of internationalization, as opposed to Stage and/or Network approaches to internationalization (Figure 5), and supports earlier ideas on cyclical influences on intermediary choice in importing (Wheeler et al, 1996) and on cyclical time in internationalization (Hurmerinta-Peltomaki, 2001). The authors suggest future research to either support or challenge the cyclical mode of internationalisation arguing that it may provide a better understanding of a more holistic internationalization process of the firm.

While extant literature has emphasised the role of domestic and foreign country factors on the initial choice of foreign market entry mode, less is documented on the effect of changes in the external environment, or indeed internal changes within the firm on the continuance of internationalisation beyond selection decisions. Perhaps the questions that most need to be addressed by firms and researchers is: “To what extent is this mode of operation continuing to deliver returns and positive performance, and if less than optimal, what change would effect better attainment of projected targets?” In effect, internationalisation, rather than an end in itself, is part of the strategic armoury of the firm.

Figure 5. Cyclical mode of internationalization



POLICY IMPLICATIONS

From a government policy viewpoint, the findings suggest that networking heavily influences the internationalisation process of small firms, specifically the speed at which internationalisation occurs and the decisions regarding both market selection and mode of entry. However, given the dependence of international growth on networking, policy makers should pay special attention to what kind of resources a firm lacks at the beginning of its international activity and when these resources need to be acquired, as these two issues directly impact subsequent internationalisation performance of a firm. The fate of Firm 2 is typical of firms that lack the capacity, cash flow and investment necessary to support internationalisation. Advisors should address the adequacy of the firm's domestic resource base first and foremost before proffering advice on expansion, whether domestic or international.

Also, as policy makers encourage only outward operations mainly by means of exporting, the findings suggest that inward activities should not be overlooked. Firms' decisions to reduce or terminate international engagement should not be viewed so much as a failure, as part of the firm's learning process and often as adjustment to a dynamic and often turbulent environment. Such decisions and changes need to be supported. In relation to forms of market entry, policy makers should revise their trade support mission, e.g. moving from "*Supporting Exports*" to "*Supporting Internationalisation*" thus providing a tailored cross-border, growth and development focussed support to small firms.

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